

**A NEW SPECIES OF *HYSTRICHOPSYLLA* TASCHENBERG, 1880
(SIPHONAPTERA: HYSTRICHOPSYLLIDAE) FROM GUATEMALA**

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Abstract.—*Hystrichopsylla guatemalensis*, n. sp., is described from Guatemala, collected from the shrew, *Sorex veraepacis* Alston, 1877. A tentative key is constructed for the four Mexican and Central American members of the genus, although two of these species are known only from one sex. Members of the genus occur at higher Central American elevations (2100–3100 m). It is hypothesized that worldwide, members of *Hystrichopsylla* display primitive morphological characteristics and frequently parasitize primitive mammalian hosts, such as moles and shrews. This association suggests coevolution of parasite and host.

Key Words: *Hystrichopsylla*, distribution, host, shrew

There are currently three named members of the genus *Hystrichopsylla* from Mexico. Unfortunately two of these are known from single specimens. *Hystrichopsylla orophila* Barrera, 1952, was described from a single male specimen taken from *Microtus mexicanus* (Saussure, 1861) from the slopes of Popocatepetl volcano, Edo. Mexico, at an altitude of ~3100 m. Later that year *Hystrichopsylla kris* was described by Traub and Johnson from a single female taken on *Neotomodon alstoni* Merriam, 1898, from Mt. Tancitaro, Michoacán, altitude not given. The third, *H. llorentei* Ayala and Morales, 1990, was based on one male and five females from Puerto del Gallo, Municipio de Atoyac de Alvarez, Guerrero, from *Peromyscus thomasi* Merriam, 1898 (holotype) and *P. megalops* Merriam, 1898 (allotype, 4 paratype females). Collections came from elevations between 2100–2400 m. In this case, the authors theorize that this species is probably restricted to the higher parts of the Sierra Madre del Sur in Guer-

rero, an area of high endemism with clear Nearctic and Andean affinities. Following is a description of a fourth species, this one from Guatemala.

***Hystrichopsylla guatemalensis* Lewis and
Eckerlin, new species**
(Figs. 1–4)

Diagnosis.—This species differs from those mentioned above in that both sexes have only 5 spines in the genal ctenidium, the exception being 1 male and 1 female with 5 on one side and 6 on the other. With 12 of the 14 specimens possessing 5 spines per side it seems that this is probably the normal pattern for the species. Further, it differs from *H. orophila* in the shape and chaetotaxy of the male fixed process, st VIII and st IX (Figs. 2, 3). It differs from *H. kris* in that the fossa of the spiracle on t VIII is tubular and extends to the posterior margin of the tergite. Finally, it differs from *H. llorentei* in lacking the cluster of fine setae near the apex of male st VIII and in

the contours of the caudal margin of st VII in the female.

Description.—Large fleas; females 4.9 ± 0.3 mm ($n = 11$) and males 4.4 ± 0.1 mm ($n = 3$).

Head: Frontal tubercle present but not pronounced. Frontal setal row of 6–7 bristles, no well defined ocular row, but a preocular row in front of vestigial eye. Remaining preantennal chaetotaxy of 15–20 fine setulae arranged in no particular pattern. Trabecula centralis conspicuous, oval. Dorsal margin of antennal fossa lined with ~12–15 setulae, 2 preoccipital setal rows of 2 and 5–6 setae per side. Occipital row of 7–8 setae per side. Usually with five spines in genal comb per side except as noted in diagnosis.

Thorax: Pronotum with 2 well defined rows of ~8 long setae per side. Total spines in pronotal comb in male; 25(1), 26(1) and 27(1); female 24(2), 25(1), 26(4), 27(2) and 28(2). Main setal row on mesonotum ~6 per side in male, ~8 per side in female. Remainder of surface covered with 5–6 irregular rows of short setae. One pseudoseta per side high up under mesonotal collar. Outer surface of mesepisternum-epimeron with ~25 setae in ~5 irregular rows. Main setal row of metanotum 5 per side. Remainder of surface with ~20 setae per side arranged in 3 rows. Metepisternum with 1 long bristle, metepimeron with ~15–18 setae per side arranged in 4 irregular rows. No marginal spinelets on metanotum.

Legs: Forefemur with a false comb on caudal margin. Tarsal segment V of all legs with 5 pairs of lateral plantar setae, none shifted on to plantar surface.

Abdomen: Setae in main row on male tergites I–VII: I 5, II 8, III 8, IV 8, V 7, VI 7, and VII 6–7; female I 5, II 8–9, III 8–9, IV 7–9, V 6–9, VI 6–8, and VII 4–5. Marginal spinelets on male tergites II–IV: II 3–5, III 2–4, and IV 2–3; female II 3–8, III 2–4, and IV 2–4. Three antesensorial setae in both sexes. In male lateral setae ~ $\frac{1}{3}$ the length of median, in female laterals closer to $\frac{1}{2}$ length of medial, lower seta somewhat

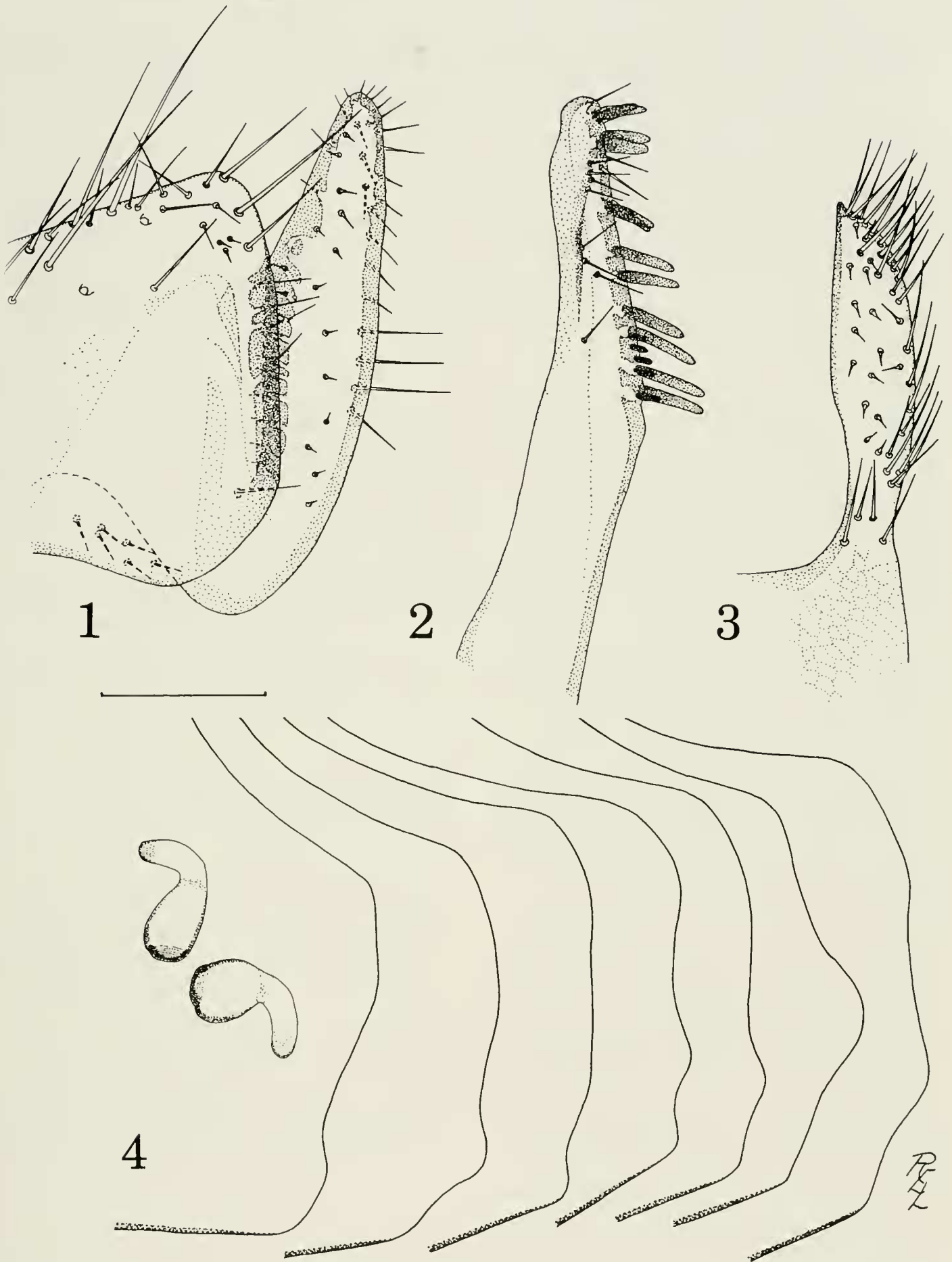
longer than upper seta. Spiracular fossa cylindrical in both sexes, straight in female, somewhat bent dorsad in male. Six to 8 small setulae per side above spiracle. Three long setae in main row on sternites III–VII preceded by a few shorter bristles in male, 4 in main row on sternites I–V in female, 5 on VI, 6 on VII and ~4 on VIII. Sternites VI–VII with 10–18 shorter bristles arranged in irregular rows.

Modified abdominal segments: Male (Figs. 1–3) with apex of movable process extending ~ $\frac{1}{4}$ its length beyond apex of fixed process. Apical 3 spiniforms of st IX paired, remainder unpaired. Apex of st VIII tapered to a point bearing a cluster of setae on its caudal margin. Female, (Fig. 4) with spermathecae and variation in caudal margin of st VII as illustrated.

Types.—Holotype ♂: Ex *Sorex veraepacis* Alston, 1877, Guatemala, El Progreso Department, San Agustin Acasaguastlan, Reserva Biosfera de la Sierra de las Minas, Montaña Pinalon $15^{\circ}04'54''N$ $89^{\circ}55'59''W$, 2700 m, 4-V-1998, R. Eckerlin leg. Allotype ♀: Ex same host species but Guatemala, Zacapa Department, Rio Hondo, 6 km NNW of San Lorenzo, Reserva Biosfera de la Sierra de las Minas, $15^{\circ}08'26''N$ $89^{\circ}40'36''W$, 2200 m, 4-VII-1996, S. G. Perez leg. Paratypes: Same data as holotype but 15-II-1996, S. G. Perez leg. 1 ♀; same data as holotype but 8-V-1998, R. Eckerlin leg. 1 ♂; same data as allotype but 2200 m, 15-IV-1998, 1 ♂ 2 ♀; same data as holotype but 3–8-V-1998, 7 ♀.

Type deposition.—Holotype, allotype and 1 ♂ and 4 ♀ paratypes deposited in the National Museum of Natural History, Smithsonian Institution, Washington, DC. Paratype deposition includes: 1 ♂ and 4 ♀ in NMNH, 1 ♂ 3 ♀ in the Carnegie Museum of Natural History, 1 ♀ in the Museo de Historia Natural, Universidad de San Carlos de Guatemala, and 1 ♀ each in each author's collection.

Remarks.—The prevalence of infestation of the shrews was 4 of 45 (8.9%) at the San Lorenzo site and 8 of 28 (28.6%) at the



Figs. 1-4. *Hystrichopsylla guatemalensis*. 1, Clasper of holotype male. 2, Apex of st IX of holotype male. 3, Distal arm of st VIII of holotype male. 4, Spermathecae and caudal margin of allotype female, plus variation of this structure in 6 paratype females. Line = 20 μ .

Pinalon site. Overall prevalence was 16.4%. Three *Cryptotis goodwini* Jackson, 1933, from the same sites were not infested.

The genus *Hystrichopsylla* is generally thought to be among the most primitive of all fleas. One argument used to support this hypothesis is that primitive fleas tend to infest primitive hosts, and this is buttressed by the preference of the European *H. talpae* for insectivores. This appears to be less the case with Asian and Nearctic members of the genus and none of the Mexican or Central American species until now have been taken on moles or shrews (Insectivores) but rather have come from rodents (Rodentia).

Other characters that suggest primitivity are the retention of two spermathecae in the female, the dense vestiture of setae covering the body in both sexes, the similarity of the male genitalia among different species and the relative simplicity of the aedeagus. In truth, very little is known of the phylogenetic relationships within the order Siphonaptera. Perhaps molecular studies will unlock some of these secrets in the future, but to date little has been published on the matter. However, although few in number, it is possible to construct a simple key to the Mexican and Central American species using mostly somatic characters. The following is an effort to do so.

- 1. Five teeth per side in genal comb, 24–28 teeth in pronotal comb *guatemalensis*
- Six or 8 teeth per side in genal comb, more than 32 teeth in pronotal comb 2
- 2 Eight teeth per side in genal comb, 46 teeth in pronotal comb (cluster of small setae near apex of st VIII in male) *llorentei*
- Six teeth per side in genal comb, 32 or 42 teeth in pronotal comb 3
- 3 Thirty-two teeth in pronotal comb; fossa of spi-

- racle on 1 8 cylindrical and extending to margin of tergite (only male known) *orophila*
- Forty-two teeth in the pronotal comb; fossa of spiracle on 1 8 tapering caudally and not extending to margin of tergite (only female known) *kris*

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